Geology Matters

The newsletter of Malvern U3A geology group
October 2017

And now for the serious stuff

Groan. Oh well, just a small moment of levity before we get down to the indoor programme and its interesting and possibly challenging variety. In the newsletter we'll continue looking around for the unusual as well as the latest discoveries, and there are plenty of both around.

The Tour de France is an expression of how keen the French are on cycling, but it is probably something you have to experience in order to fully appreciate. It has even intruded itself into French geomorphology as you can tell from this picture of "The velodrome of Esclangon"..

The Velodrome is a large recumbent fold spilled southward, formed at the end of the Tertiary (23 to 5 MYA) at the Alpine front. It consists of a sedimentary series composed mainly of sand, sandstone and conglomerate (rock composed of pebbles welded by a rocky cement) produced by erosion of the Alps. This material accumulated at the foot of the reliefs in the Alpine sedimentary basin of Valensole, along which the fold of the Velodrome was formed.

Wave goodby in Arizona

This is one of those places that you are more likely to see photographs of than visit. It is a fragile environment and access is controlled by a lottery permit system – it is also quite a hike too. Those beutifully sculpted rocks consist of intersecting U-shaped troughs that have been eroded into Navajo Sandstone of Jurassic age. Initially, infrequent runoff eroded these troughs along joints within the Sandstone. After their formation, the drainage basin, which fed rainwater, shrank to the point that the runoff became insufficient to contribute to the cutting of these troughs. As a result, they are now almost exclusively eroded by wind, as shown by the orientation of erosional steps and risers cut into the sandstone along their steep walls. These erosional steps and risers are oriented relative to the prevailing wind as it is now naturally funnelled into and through these troughs.

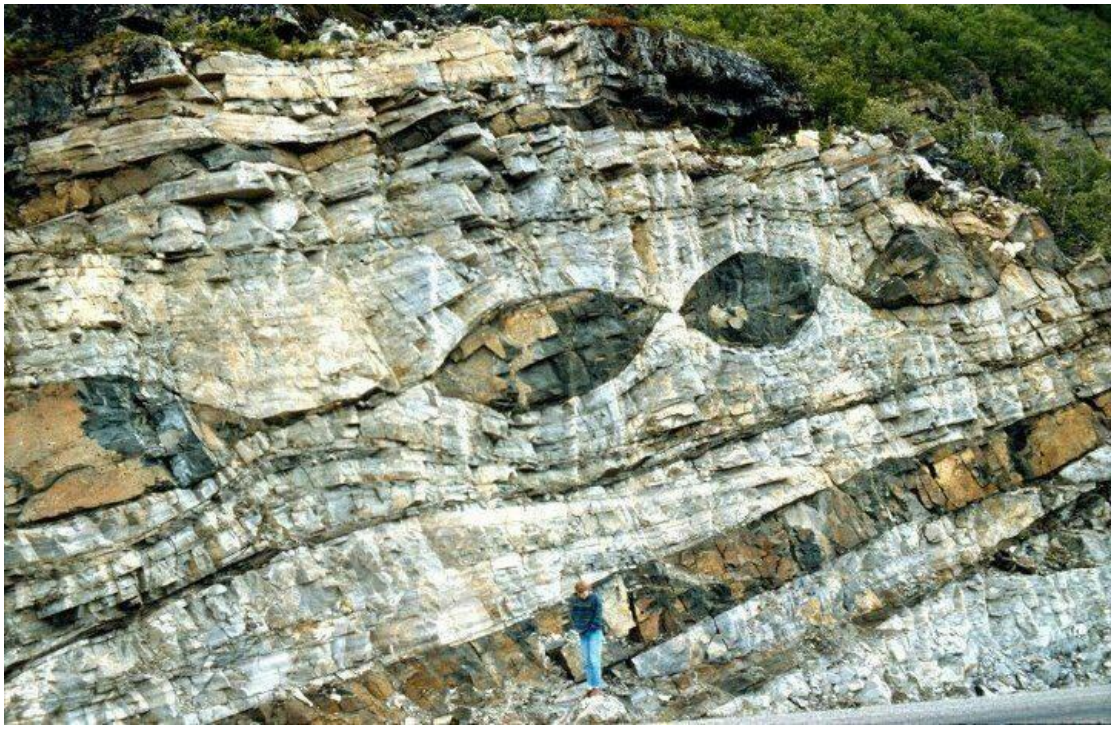
The Wave consists of sets of cross-bedded eolian sandstone composed of rhythmic and cyclic alternating grain flow and wind ripple laminae. The rhythmic and cyclic alternating laminae represent periodic changes in the prevailing winds during the Jurassic period as large sand dunes migrated across a sandy desert. The thin ridges and ribbing seen within the Wave are the result of the differential erosion of rhythmic and cyclic alternating grain flow and wind ripple laminae within the Sandstone. These laminae have differing resistance to erosion as they have been differentially cemented according to variations in the grain size of the sand composing them.

And on now to New Mexico

To see another fabulous example of erosion. These surreal looking rocks are known as The King of Wings rock formation. A visiting photographer reported it like this . The clayish hills that cover most of the wilderness are composed of thin layers of coal, silt, shale and mudstone with varying hardness and coloration, and are mixed with more resistant sandstone which has eroded into thousands of weird formations – hoodoos, ridges, arches, balanced rocks and small slot canyons. Many ravines created by rainwater erosion cross through the hills, which also harbor occasional caves and narrow fissures several meters deep. Much of the surface is unstable – the layers are often loose, rocks are crumbling and some of the formations are quite delicate, so hikers should take care not to damage the features; there are no established trails, but walking along the ravines and the valley floor is the usual way to explore. Petrified wood is scattered across the surface, especially to the southeast – sometimes entire tree stumps, with the bark and growth rings still clearly recognizable. Fossils may also be found, and the teeth and bones of a variety of large dinosaur species have been discovered embedded in the earthy layers

Boudins,well French sauages to you

These curious structures are formed by tectonic foces which have caused the stretching of rocks, sometimes simply ribbon shaped, but on other occasions the more distinctive sausage shapes. These in the un-attributed photograph rather fall into the category of mega boudins. For scale, look at the figure at the bottom centre.



Rock of the month

And quite an impressive one too. These are paradoxides trilobites from the mid Cambrian era. They are large to very large as trilobites go and the largest recorded is 37 cm long. Some of those in the picture can't be far short of that. The dealer who was offering this collection for sale was asking for £15 000

Have you ever wondered

Where all those weird and wonderful names such as Pridoli or Messinian came from and how they fit into the geological time scale.? Well your

sleepless nights are over – here is the geological time scale and its sub divisions, and its sub sub divisions, oh you get the picture. Follow the link for a pdf file that .reveals all in minute detail.

http://www.stratigraphy.org/ICSchart/ChronostratChart2017-02.pdf